

### **ABSTRACT**

Methods of forming a germanium on insulator structure and its associated structures are described. Those methods comprise forming an epitaxial germanium layer on a sacrificial silicon layer, removing a portion of the epitaxial germanium  
5 layer, activating the epitaxial germanium layer and an oxide layer disposed on a silicon substrate in an oxygen plasma, and bonding the epitaxial germanium layer to the oxide layer to form a germanium on insulator structure.